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serve to be widely read by a class of half educated "species describers" which vex good naturalists the world over.

We regret that the distinguished author includes the Protozoa in the Radiates, for what radiate feature do the Amœbas, Foraminifera, Sponges and Infusoria possess? Why also are the Tunicates, which homologize so closely with the Lamellibranchs, placed between the Polyzoa and Brachiopods?

We are by no means satisfied with the author's treatment of the class of Insects, comprising in his estimation the subclass Hexapoda and Myriapoda. He considers that there are nine orders of six-footed insects (Hexapoda). He retains the "Aptera" as a distinct order, the types being the Lice and Springtails (Podura, etc.). Now the Lice are proved to be low Hemiptera, and the Springtails are closely related to the Neuroptera, if they do not compose a family of that group. The Coleoptera are regarded as the highest, the Hymenoptera being placed below the Neuroptera even! Notwithstanding all we know of the Fleas, they are also consigned to a separate "order," though proven to be a family of diptera. A very objectionable feature to us is the rank assigned to the Spiders, or Arachnids. They are placed as a "class" above the insects. Their mode of development, their want of a true metamorphosis (except in certain genera of Acarina), their morphology—all convince us that they are inferior to the Hexapoda, and do not show class characters, any more than do the Myriapoda. In his definition of the class the author says "antennæ rudimentary or mandibuliform." The antennæ as proved by anatomy and especially embryology (see Claparède's great work on the embryology of the spiders) do not exist in the Arachnids. The so-called antennæ are the mandibles. What are the "tentacles" in this group, the palpi? Of his order Dermophysa, of which we see no necessity, the Demodex represents a family of the mites, and the Tardigrades are in all probability the types of another and the lowest family of Acarina, while the Sea Spiders (Pycnogonids) are truly crustaceous, as proved very satisfactorily by the able embryological researches of Dr. Anton Dohrn. The Spiders are to our mind higher than the Scorpions and Phrynidæ.

The cuts are for the most part indifferent, and the printing only endurable, while the typographical errors are so numerous, and in some cases so egregious that we suppose the author did not read the proofs owing to his absence in Europe. In a second edition the shortcomings we have plainly alluded to could be easily corrected, and a cheap, practical, very readable and exceedingly useful manual be produced, and one that would deserve a wide circulation.

A NATURALISTS' GUIDE.*—This is an excellent little work—one so good, in fact, that we only wish there were more of it. It is difficult, if not im-

* The Naturalist's Guide in collecting and preserving objects of Natural History, with a complete list of the Birds of Eastern Massachusetts. By C. J. Maynard. With Illustrations by E. L. Weeks. Boston: Fields, Osgood & Co. 1870. (For sale at the Naturalists' Agency. Postage paid \$1.90.

possible, to give the novice in collecting and taxidermy all the information he requires, in so little space as Mr. Maynard occupies; and in condensing to the utmost, he has left unsaid some things that it would have been advisable to say. If cramped for space the writer might have profitably given up the brief notes upon Reptiles, Fish and the Invertebrates, to make room for more details respecting the taking and preserving of Birds and Mammals—these being evidently his “specialty;” and the loss would not have been great, since the directions regarding the lower animals seem to us too slight and general to be of much real service. Still, attentive study of the book will probably furnish hints and suggestions enough to enable any one to make a good beginning. Regarding the collecting of birds, it gives us much pleasure to observe that Mr. Maynard writes of what he himself knows, and that evidently this is not a little. His notes of the proper times and places to look for birds—of the pleasures and difficulties of taking them—and his pictures of field-work, are true to the life. We have abundant evidence that he has put himself in no danger of tripping by compilation. Thus, for example, his remark upon page 84, “that birds for a certain period increase in size, after which they gradually decrease,” is none the less true because it expresses a fact of which few are aware; and it is one not likely to be found out except by long continued and repeated observation. We endorse the observation without reserve. Most birds are at a maximum size before they are perfectly “adult;” on reaching which state, a certain condensation or compaction of the frame seems to take place, so that they become somewhat smaller. Of this the Bald Eagle is an excellent illustration.

The art of preparing birds for the scientific cabinet, no less than that of mounting them for public exhibition or other popular end, is one acquired only by practice, in gaining which we suppose each taxidermist insensibly grows into ways of his own; so that probably no unvarying rules can be laid down. Mr. Maynard's method is different in many respects from the one we have found preferable; yet we do not wish to call it inferior on this account, the more particularly since we have not the pleasure of being familiar with his work, and are therefore not in position to judge of the real merits of his method—still less of the degree of skill he may have acquired in using it. But we are bound to add, that we see no reason why excellent results should not be obtained by following his directions. The whole matter, after all, hangs upon good taste to begin with, then upon nicety of touch, and finally, upon practice. While we have no difficulty in following out his description of the process he employs, we fear it may be found by the beginner a little obscure at places—or at least, not so full and plain as it might have been made. This brings us back to the thought that prompted our opening sentence; we wish the directions were more ample. Nothing is said, for example, of the first difficulty in skinning—that of separating the feathers properly on the abdomen, and keeping them out of the wound afterwards;

nor of the very next trouble—to avoid attempting to take off the thin abdominal walls with the skin, as beginners almost always do. We are in the habit of directing that the cut be begun a trifle above the lower border of the sternum, since, as nothing but skin can be lifted away there, a guide is found at the outset. We think there is a better way of cleaning off the leg and wing muscles than that the writer advises. We nip off the head of the bone by introducing the closed scissors between the muscles, and opening them just wide enough to grasp the bone; then we strip the muscles from above downward, and snip all the tendons at a single stroke below. Practically, with small birds at least, this is done with the thumb-nail, in an instant. Except in the cases of certain long-winged birds, we do not agree with the author that the humerus should be left in; we remove it, and the radius too, leaving only the ulna, which we separate from both the other bones and all the muscles by cutting its head away from the elbow-joint, stripping the muscle off from above downward, and then removing humerus, radius and all the muscle by a transverse stroke of the scissors just above the carpal joint. A description should have been given of the neat and rapid way of removing the brain and all the head-muscles by the four special cuts that may be made in an instant; instead of the general directions for scooping out and scraping the skull. We think the writer hardly puts the tyro sufficiently on his guard against stretching a skin unduly, particularly at the neck, and so producing that ugly bare space on each side, difficult to rectify afterwards. Except in the cases of large birds, where main strength and awkwardness do well enough, no skin should be pulled, or even drawn, off; but should be *pushed* instead; and as soon as it hangs by the neck, with legs and wings dangling, it should be supported in one hand to prevent stretching. For the “make-up” of a skin more explicit directions would not have been amiss; more than one novice will probably do all that he is here told, and then spoil his specimen. We should like to make a few suggestions regarding this matter, but want of space prevents, as it does our even alluding to a score of little points which will not be found in this or any other book on taxidermy that we have seen, but which are nevertheless very good things to know; and after all, a few hours actual practice under the eye and tongue of a competent taxidermist, will be found more valuable than any treatise upon the subject can possibly be made.

In Part II, Mr. Maynard gives what we find to be a very complete and otherwise excellent list of the birds of Eastern Massachusetts. We do not notice a single species that we would erase, and believe that but very few remain to be added. In the nomenclature of the species he adopts the changes that Dr. Coues has shown to be necessary or advisable in certain families; and in matters specific he is nearly as conservative* as

* Thus he does not admit *Turdus Aliciæ* Baird, *Troglodytes Americanus* Aud., *Ægiolus exilis* Coues, *Larus Hutchinsii* Rich., and *L. Smithsonianus* Coues. Our *Certhia* and *Eremophila* respectively he refers to the European *C. familiaris* and *E. alpestris*. Whilst our hand is in, we may mention the following cases, all in a single order, where the writer might have con-

Mr. Allen. The notes of habits, etc., are very valuable and useful, and, like Mr. Maynard's directions for collecting, are evidently an original record of the observations of an excellent field naturalist. We have thus the large amount of definite information that is always afforded by good local lists. While we believe that the list gives us no actually new names (its main points, if we recollect rightly, having been already presented in the *NATURALIST* by Mr. Allen), several of the entries are of special interest and importance. Among these may be mentioned *Centronyx Bairdii*, *Argytira maculata* (accidental), *Xanthocephalus icterocephalus* (accidental), *Tyrannus dominicensis* (accidental), *Passer domestica* (introduced), *Chondestes grammacus* (accidental), *Turdus naevius* (accidental), *Helminthophaga peregrina*, *Falco sacer* (unusually southern), *Strix pratincola* (rarely so northern), *Micropalama himantopus* (rare), *Macrorhamphus scolopaceus*, *Thalasseus acyflavidus*, *Pelecanus trachyrhynchus*, and *P. fuscus* (both of these last accidental). The first named Mr. Maynard considers as more likely to be a winter visitor from the north, than a straggler from Nebraska. *Quiscalus major*, *Agialitis Wilsonius*, and a few other species occurring in Allen's or Coues' lists, he dismisses as resting upon insufficient evidence; probably in most instances he is correct in so doing. The supposed *Buteo "Cooperi"* turns out to be a state of *B. lineatus*. A good description of the nest and eggs of *Helminthophaga chrysoptera* is given. The plumages of *Scops asio*, and the relationships of *Sterna macrura* and *S. hirundo*, as well as those of *Troglodytes ædon* and *T. Americanus*, are discussed at some length. In the case of the *Scops* it is evident that ornithologists will not be likely to come to any agreement, until they conclude, as we did long ago, that the variations in the plumage are purely accidental. In an appendix, Mr. Maynard tabulates all the species in convenient form.

We have been so pleasantly impressed with the book, and others will doubtless find it so useful, that we feel the less hesitation in criticising some things in it that we cannot praise. A little care would have prevented such slips as "carpel" for *carpal* (p. 20), "coccygus" for *coccyx*, or for *os coccygis*, "arctea" for *arctica* (p. 152), "Argyria" for *Argytira* (p. 164), "penguin" for *peregrine* (p. 134), etc. We fear, however, that the writer himself is responsible for such awkward blunders as — "where the humerus joins the sternum" (p. 40); and the mention of the wrists and heels of sheep and deer as "knee joints" (p. 49). The figures we cannot speak well of; in fact, they are very bad, and we should judge that they will hardly answer the purpose for which they were designed. Thus we

sistently questioned specific validity: *Falco anatum*, *Astur atricapillus*, *Pandion Carolinensis*, *Otus Wilsonianus*, *Brachyotus Cassini*, *Nyctale Richardsoni*. There are many others, as nearly allied to European types, that he allows to stand. Though we agree with the writer in being rather inclined toward conservatism, we could wish that, before discussing the grave questions that arise from our varying acceptance of the term "species," he had adopted a more lucid and less ungrammatical definition than this: "Species consists in a bird's having certain characters so well defined, although inconstant (but never variable beyond a certain point), that it may readily be distinguished from others." (p. 85.)

trust that Fig. 3, Plate VIII, was not taken from an example of the author's handiwork! The book is well printed and handsomely gotten up. We hope it may acquire the popularity to which its merits entitle it.

ORNITHOLOGICAL RESULTS OF THE EXPLORATION OF THE NORTH-WEST.* This memoir gives the first published results of the Russo-American Telegraph Expedition, organized to explore preparatory to the connection of San Francisco and St. Petersburg by electric telegraph. The officers of the company arranged with the Smithsonian Institution and Chicago Academy, in broad and liberal spirit, for the scientific exploration of the country by a corps of young naturalists headed by Major Robert Kennicott. The party left San Francisco in July, 1865, by several vessels, touching at various points, where collections were made. Starting again, July, 1866, after wintering in San Francisco, Mr. Dall visited Plover Bay, East Siberia, and afterward St. Michael's, Norton Sound, where he learned of Major Kennicott's death, in consequence of which the direction of the scientific corps devolved upon him. Messrs. Pease and Bannister accompanied the remains to San Francisco, while Mr. Dall and his party started for the Unalaklik River and the Yukon, reaching Nulato in December, 1866, and remaining there all winter. In the spring they proceeded to Fort Yukon, and then returned to St. Michael's, where intelligence was received of the termination of the enterprise. Notwithstanding this Mr. Dall decided to finish the scientific reconnoissance of the Yukon River, remaining in the country alone and at his own expense. He proceeded with Eskimos to Unalaklik, where he remained until November, 1867, and in March, 1868, went to St. Michael's, after examination of the country both east and west of Nulato. Crossing the portage in June he descended the Yukon to its mouth, and shortly afterward embarked for San Francisco, from St. Michael's, touching at Pribylof and other islands. The ornithological results thus obtained by Mr. Dall and others, during several years of travel and exploration, are worked up in the paper now under consideration, and in the one we shall presently notice.

We find the memoir to be one of special interest and importance, as was to have been anticipated, no less from the character of its authors and of the other naturalists whose collections contributed towards it, than from the nature of the ground explored, and other fortunate circumstances. It is not too much to say that no single paper has appeared for the last decade, and perhaps for a longer period (although we do not forget the results of Mr. Xantus' explorations), that has added so positively to our knowledge of the geographical distribution and habits of our birds, or that has so largely and at once increased our bird-fauna. In noticing so important a contribution to ornithology we cannot refrain from presenting some of the leading points in detail, although even a bare epitome of all the results obtained would exceed our limits. Before so

* List of the Birds of Alaska, with Biographical Notes. By W. H. Dall and H. M. Bannister. Trans. Chicago Acad. Sci., Vol. i, Art. ix. 1869.